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ABSTRACT

This paper presents two puzzles that have emerged in a series of completed and ongoing studies at Queen's University, Ontario. These puzzles concern teachers' professional knowledge, a term used to refer to the non-propositional forms of knowledge assumed to be of importance to professional action. This research assumed that the professional actions of teachers are better understood if it is known how they construe their professional realities. Study findings suggested that important ways of construing professional action may not be carried in the form of linguistic fragments, but rather by teachers' use of metaphorical figures to describe their work. The two puzzles examined are: the way that metaphors become part of professional speech, and the role that metaphors play. The paper begins with reviews of the principal findings of the two studies on metaphor. The next section discusses the puzzles raised by these studies and how they might be addressed. This leads to an account of an ongoing study of the development of professional knowledge. Some examples illustrate the progress made, and the problems that work of this type poses for understanding the nature and development of professional thought. (JD)

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METAPHORS, PUZZLES, AND TEACHERS' PROFESSIONAL KNOWLEDGE[1]

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Introduction

The purpose of this paper is to present two puzzles that have emerged in a series of completed and ongoing studies at Queen's University. These studies have been concerned in various ways with teachers' professional knowledge, a term used to refer to the non-propositional forms of knowledge that are assumed to be of importance to professional action. As shown below, the research has been propelled by the assumption that we might better understand the professional action of teachers if we understood how they construed their professional realities. The studies were built on an earlier one in which two objectives were attempted: to explore the limitations of the contemporary work on teacher thinking and decision making (Munby, 1982), and to use the Repertory Grid Technique of Kelly (1958) as a means to uncover something of the teachers' constructions (Munby, 1983, 1984). The Repertory Grid study was not particularly successful because the teachers' constructs emerging from the data seemed to result more from the interaction of the research with the teachers concerned than from the teachers alone. Indeed, the study suggested that important ways of construing professional action may not be carried in the form of linguistic fragments. Yet, the data themselves revealed an unexpected phenomenon that was inherently interesting: Teachers were using several metaphorical figures to describe their work. Examining manifestations of this phenomenon became the target of the studies that followed. In turn, these studies gave rise to the puzzles to be discussed in this paper: The first puzzle is how metaphors become part of professional speech, and the second concerns the role that metaphors play.

The paper begins with review of the principal findings of the two studies on metaphor. The next section discusses the puzzles raised by these studies and how they might be addressed. This leads to an account of an ongoing study of the development of professional knowledge. This work has its origins in Schön's (1983) *The Reflective Practitioner* and in previous research of my colleague and collaborator, Tom Russell. Some examples illustrate the progress made so far and the problems that work of this type poses for understanding the nature and development of professional thought.

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Two Studies of Metaphor

The first study in this series, "Teachers' Beliefs and Principles: A Study of Metaphor," was directed at discovering the metaphors that teachers used when describing their professional work. The study was built on the recent work on metaphor by Schön (1979) and by Lakoff and Johnson (1980) in which the centrality of metaphorical language for conceptualizing phenomenon is a central theme. Because the object of the study was to document the kinds of metaphors used, the nature of the data seemed to be relatively unimportant. In this case, interview data from another source was used. Details of the data and their analyses have been reported already (Munby, 1985, 1986a); so it suffices to say that the quantity of data for each of the six teachers was large (over 7,000 lines), that the interviews were conducted over four months, and that the computer techniques used showed that the metaphors discovered were employed consistently over time. For present purposes, it is helpful to review some of the metaphorical figures found in the data.

The metaphors all fell within the category of ontological metaphors, as defined by Lakoff and Johnson (1980). Thus, ideas, attention, behavior, mind, and curriculum content are often presented as if the term referred to objects. Some examples for grades and attention are helpful: "trying to get attention," "they really can't pay attention," "catch all their attention," "he did get a mark," "I would give them points," and "they want to keep that A." There are two interesting points to note in these examples. First, they may not strike us as being unusual for we are accustomed to speaking in these ways. Second, we may not notice too that the metaphors being used treat the terms as if we are talking about commodities that can be given, taken, traded, and so forth. This is true not only of talk about grades and attention, but also of time: "given the right amount of time," "they wasted some time," and "spend more time working on class participation."

Some ontological metaphors in the data have an orientation associated with them. Again, we may not be surprised by these examples until they are highlighted: "good grades, *top* students," "I was right *on top* of them," "they get riled *up*," "keeping the class *under* control," and "he doesn't flare *up* very often." The language here, as does much language about schooling, represents achievement and order or control as something that can be viewed as existing on a vertical dimension, with the conditions that are prized above those that are not. Lakoff and Johnson (1980) draw attention to such examples as *high* repute and *low* morals to show how approbation is generally represented linguistically.

Four metaphors are of particular interest to me for they concern lessons, information, mind, and the subject matter. The data contain so many instances of language depicting motion that one is virtually compelled to suggest that lessons are constructed as moving objects. Examples of this figure in the speech of one teacher, Alice, and their analysis are cited here from an earlier paper.

> "I just went ahead," "they're always a step ahead of the other classes because everything goes so smoothly," "we move along faster," "we'll probably even back up a little bit," "these kids need a push in every direction," "in that particular class, uh, we go very slow," "if he's lost...he's just going to get further behind," "they like to get off of the subject on to different topics," "we didn't get to that," "we didn't even get past those ten sentences today," "I get carried away sometimes," "if I go right back to the basics," "I hate going over that two and three (times)," "I might move on," "it was time to move on very quickly," "I'm pushing and backing up as far as I can," "I thought the class went fairly slow," "I just start from scratch," "he's kind of a slow starter," "we went through

it real quick," "she was slowly plowing through it," "I finally got to the point," and "they get behind."

The common element of movement in these fragments is taken to represent the metaphorical figure "Lesson as a Moving Object." It is as if Alice views her professional reality as continually in flux. But the figure is complex because everything and everyone seems to be caught up in the movement: Alice moves, the children move, and the content moves. This complexity suggests Alice uses a movement figure to think of many aspects of her work: children are ahead, behind, or lost, for example. The fragment "I was losing some of them and I wanted to go all the way back" shows how Alice uses a compilation of related movement terms to explain the function and conduct of review. Pace is caught up here, then, just as what is "covered" signals that the metaphorical figure has a spatial character, the coverage being the subject matter involved.

Possibly, on its own, there is nothing particularly remarkable about viewing a lesson as a moving object. Common parlance suggest in various ways that courses and lessons run through time. Yet, it is remarkable that the language of the movement figure is extended into so many of the commonplaces of classrooms. (Munby, 1986b, pp. 5-6)

Ways in which information and ideas are presented are interesting because they coincide with Reddy's (1979) analysis of the conduit metaphor. This metaphor, a special case of the commodity metaphor, represents communication as a simple matter of transferring information from one place to another along a conduit. In the data, information is got out, given, missed, picked up, kept, thrown in. Some examples are: "get it out more clear to the kids," "it just comes out that way," "I'll give him a serious answer," "I give them the word," "give him an abstract concept," "I have given my viewpoint," "they took it as it came," "I give them an anecdote," "he'll give me a wrong answer," and "I will give them both sides."

In one important aspect, the conduit metaphor for depicting information is coherent with how the mind and learning are represented in the data. Often, the mind is a container ("things come into my mind") into which transferred information is placed. For one teacher the mind has a top, front, back and surface: "what was foremost in his mind," "that was uppermost in their minds," "in the back of my mind," and "whatever's on their minds." Learning is sometimes a matter of catching, picking up, and taking in information, suggesting a consistency with the conduit metaphor.

There are two interesting metaphors about subject matter. Ede, for example, speaks of subject matter as something that is *covered*: "a chapter that he's already covered," "I needed to cover latitude and longitude," "what we expect to cover in that year's time," "I just covered modern Texas through a couple of filmstrips," "they cover a lot of material in a short length of time," and "you're so intent on covering *so* much."

When Chad talks of the subject he teaches, mathematics, he uses language suggestive of a sequence of steps: "we try to built on the theory," "we've been dealing with formulas," "they could arrive at the products in a short method," "we're going at this step," "how well you follow those procedures...and steps." The idea of mathematics as a a series of progressive but discrete skills is also evident in Mike's data.

People do math in big chunks...If they are having trouble, I will advise them to try the basic level...I always say, "Go on to the next bunch of questions"...If they do want to get ahead, they can because there still is that structure of the course...About four or five students that have dropped down have resurfaced...I am modulating the course; it is going to be a cycle and people can enter the cycle at any time and just pick up and work

on that section and then go on to the next unit...If the student wants to get ahead of the (course) cycle, they can.

Puzzles Raised by the Data

It might be simple to discount the metaphors given above by suggesting that they represent little more than habitualized speech, and then to suggest that there is no reason to expect a relationship between the metaphorical language teachers use and how they plan and execute their work. For the present, we find this line of argument to be unsatisfactory because, even making allowances for some flexibility and uncertainty in what we count as a metaphor, it is hard to avoid noting that these patterns exist. Accordingly, it is equally hard to disregard the two puzzles that these linguistic phenomena present.

The first puzzle concerns how such metaphors become part of a teacher's ordinary speech. Clearly, many reflect our conventional ways of speaking and thinking--we tend to think of achievement as placed on a dimension from higher to lower. Some metaphors might be assimilated into language repertories from the "in-college" component of pre-service programs. Other metaphors might be adopted from the *lingua franca* of the staff room. Still others may well emerge during practice teaching and the early part of a professional career, as the novice develops personally fruitful ways to talk about his or her perceptions.

The second puzzle is related to the first, and is founded on the assumption that there is purpose to the selection and use of language. The puzzle may be posed as a question: "What roles do these metaphors play?" The presence of the metaphors challenges us to consider if they play a part in practical professional knowledge. This thought is prompted by the recently completed study by my colleague Tom Russell (1986). This study was built on Schön's (1983) account of practical knowledge, and examines teachers' reflection-in-action.

The study of teachers' reflection-in-action proceeds from assumptions that (1) professional knowledge consists of more than what can be told or written on paper and (2) professional learning is something more than a process of using "rules" to make decisions about how to behave in a classroom situation. Russell's study of the development of beginning teacher's knowledge-in-action examined the significance of these assumptions in the very earliest stages of the development of professional knowledge of teaching. The study is set in the arguments by Schön (1983) in *The Reflective Practitioner*. Reflection-in-action is seen as the process in which a professional, responding to puzzles and surprises in the context of practice, reframes a problem in a way that suggests new lines of action. The results of the new moves, which in this instance are new teaching behaviors, indicate whether the new way of thinking about the problem is both productive and free of unintended consequences. Two beginning teachers were studied intensively in the first six months of Russell's study, and the results are very promising. For example, we have very clear data about the way in which a beginning teacher develops new perspectives on her relationship to the students she is teaching. "Caroline" was prompted to rethink her relationship to her students by several incidents in which she had the opportunity to speak to students outside the classroom setting about a matter involving another student in the class. In each case, the discussion led Caroline to rethink her view of the student whose behavior was puzzling her, and the new view resulted in a reduction in classroom management difficulties.

As this work was proceeding, we became interested in the possibility of joining the study of metaphor to the study of teachers' developing practical knowledge. We believed that the studies might fruitfully coincide around the notion of reframing. If the process of reframing involves putting language to phenomena in novel ways, we might expect to witness language

patterns, particularly metaphors, changing over the course of a novice teacher's early experience. This line of thinking offered several interesting questions:

1. How do metaphors evolve as beginning teachers acquire experience and consolidate their knowledge-in-action?

2. How do dominant professional metaphors restrict the contribution of reflection-in-action in the development of a teacher's practical knowledge?

The major questions about linguistic patterns became framed for the study as questions about metaphors, especially about the relationship between the metaphors used by teachers and our attempts to understand their professional knowledge. The questions that we thought significant were:

1. What metaphors characterize the thinking of pre-service teachers?

2. Do these metaphors change over the course of a semester of student teaching and what might influence these changes?

3. How are these metaphors different from those of experienced teachers?

4. When the metaphors of student teachers and supervising teachers coincide, what are the characteristics of the student teaching experience?

5. If the metaphors conflict, are conflicts evident in supervision and evaluation of student teaching?

6. What metaphors characterize the thinking of experienced teachers?

7. Are these metaphors related to subject matter or to other features of the teaching context?

8. Are the metaphors signals about teachers' constructions of professional realities, or are they labels for private and inaccessible theories?

9. Are the metaphors generative, providing truly useful perspectives for teachers; or are they inert, reflecting no more than a form of casual professional "shorthand?"

10. To what extent are the metaphors influenced by contextual and cultural conditions? (Time, for example, is a major preoccupation for those in schools.)

11. Is it possible to discover the purposes behind metaphoric speech within casual conversation, and thus to unpack its meaning?

Early Analyses from the Current Study

The present two-year study, begun in September 1986, was designed to obtain data that might help resolve these questions, or at least clarify them. In addition, the study's data were to forward our understanding of the development of reflection-in-action. Thirteen teachers, predominantly early in their professional careers, are involved in the study and, although the data set is necessarily slender at this early stage, there is enough to show something of the puzzles that appear when one focuses on linguistic patterns in the interviews. Three brief extracts from developing cases are illustrative.

Ernie

Although Ernie has taught before, his experiences were quite different from those he encountered in the third week of the fall term. Previously, he taught in the penitentiary system, an environment that stresses individual programming and attention. In the third week of the Fall semester, Ernie was appointed as a teacher to a "street" secondary school. Here, he was faced with classes for which he was the third teacher in as many weeks, with responsibility for teaching science, a subject he was not too comfortable with, to grade nine and ten classes. The classes themselves were the last to be assigned a teacher, and the data support the idea that these were considered"difficult". Despite his apprehension about being involved in the project, Ernie agreed to participate providing that the interviewer did not insist on observing the teaching, at least for the first semester. Interviewing Ernie is challenging because he speaks rapidly and the topics he introduces change quickly. Yet, the effort is worthwhile for there is sufficient information in the four interviews conducted thus far to allow us to note some linguistic patterns, and to venture questions about these. One of these is the use of the word "problem."

Even the briefest sketch of Ernie's professional circumstance allows one to see that it offers a potential plethora of problems. A particularly salient feature of Ernie's speech is that it affords no differentiation of the severity of these problems. The following reveal the variety of phenomena (whose nature is given in parentheses) that he calls "problems": "Their problem is behavior," "and that (discipline) is part of the problem," "he had a problem (in understanding the assignment)," "(a student has) emotional problems at home...social problems," "he seems to care but I think he's got this problem (attitude)," "he realizes that there is a problem (not completing assignments)," "let's get the problem (of a mark dropping) out of the way." The language suggests that Ernie distinguishes problems from phenomena that are not problems, but that he does not linguistically differentiate problems by their persistence, salience, and severity.

Obviously, this is a tentative analysis based on a relatively small amount of data. Yet, the lack of linguistic differentiation in the discourse raises questions for the research team about how Ernie presently views classroom phenomena, and about how these views might change. We are interested, then, in seeing if Ernie's continuing experiences in some way encourage him to see the need to differentiate among problems. We might expect this to happen as he becomes more accustomed to teaching the junior high-school grades. It will be especially interesting to note the language that he invokes to characterize the differentiations that he makes. Possibly, the language will be familiar to all who work with teachers and who frequent staff rooms. If this is so, we might be able to comment on the extent to which Ernie appears to be assimilating the *lingua franca* of teachers. On the other hand, the language might be somewhat novel, unusual metaphors might be employed, in which case we would want to consider the unique potential that such terms offer Ernie's increasingly sophisticated knowledge-in-action.

We have already conceded that the above analysis is tentative and that it needs to be weighed against incoming data. Yet, the analysis is strengthened when it is considered in light of other linguistic patterns in the interviews. For the research team, the more significant of these is how Ernie describes his feelings. The point is quickly evident if we attach the label "house of horrors" to the following examples: "Then they get someone like me who's new and nervous," "(taping my class) is part of the nervousness," "first day was a scary situation," "(with no course outline) I was very scared," "kind of a scary situation," "never having taught it before is a really scary business," "going through it the first time, it's scary." Similar language is used to describe the feelings of the students: Their lighting a bunsen burner for the first time

was "a scary situation," "he was afraid to come in and admit that he had a a problem; he was afraid to approach me," and "I tried being aggressive (with one student) and it didn't scare him." The emotion most frequently mentioned in the data concerns fear, and it is frequently presented as "scary," suggesting that the intensity of the phenomena are not differentiated.

The lack of differentiation in Ernie's speech about emotions parallels the analysis of his linguistic representation of problems and so fortifies the analysis of the latter. Accordingly, the research team is interested in seeing how Ernie's descriptions of emotions alter over the course of his first year as a high-school teacher. Here, we will be watchful for signals that suggest changes in how he constructs his emotional responses, and we will be interested in the nature of the language used just as we will attempt to understand the origin and moment of the language he employs. As the case progresses, other emerging patterns is Ernie's speech are being studied for possible interrelationships of the sort discussed. It is expected that our understanding of these will be increased once the research team has been able to observe Ernie's teaching.

Carla

Carla completed her Bachelor of Education degree in May, 1987, and was hired to teach a grade two class in the following school year. The school in which she works is overcrowded, so Carla's class has been assigned to a portion of the school library. The following extracts from the first four interviews with Carla are selected to illustrate another side to the potential of the present study. Here, the analysis attends to Carla's linguistic representations of two types of teaching and learning: the teaching and learning she was exposed to during teacher education, and the teaching in which she engages. As the extracts are read, it is helpful to observe the uses of the conduit metaphor. These suggest that Carla thinks that what is to be learned about teaching can or should be transmitted in the courses of a teacher education program. Together, the language of the examples point to a view of professional knowledge as something acquired from others instead of from an interaction with experience. Importantly, this orientation is contrary to the orientation of the present study, so Carla's case is of special interest to the research team. All extracts are grouped by the date of the interview from which they are taken. Extracts within an interview are separated by ellipses.

> (October 1) I got a book from my girl friend on classroom management, like how to basically set things up....at (name of university) if they know you're doing primary-junior they should have one class or some courses set up showing you exactly what is involved in the curriculum guidelines, and showing you something for Core and giving you examples of Grades 1, 2 or 3....one one thing they need to teach you is to be more specific, like take an hour to tell you what you should be collecting over the summer, things you should be looking for, keeping your eyes open for. You know, instead of being so general they need to be more specific....I could have had more specifics....(the university) should have been teaching this....(my instructor) should have been focussing on the day to day aspect....There's no course to teach, or that says "This is a good way of record-keeping."...But I think at (the university) they should go through, like this is your first month of teaching, here's some things you can do on your first day. What do you do on your first day? You need to establish your rules, you have to set your routines, things that I learned in the Pilot Project from talking to teachers.

(The Pilot Project referred to is within the university Carla attended.)

The first two extracts from the next interview suggest that Carla acknowledges that experience is in some fashion a source of her professional knowledge. The third suggests a limitation to what was experienced at the university.

> (October 7) But unless you have a model teacher, you are not going to get all the things you should be getting. But until you really are with your own class then you don't really know....(Following her conversation with her principal, she asked herself if she was over-reacting) what could they have taught me at (the university) to prepare me for that?....Yet I look back at the things I did at (the university) and I wonder how much I really am going to use: Not a lot.

This is the first signal in the data that Carla recognizes that something about professional knowledge can be gained only from professional experience. But it is not clear that she has worked this idea through because, in the next interview, the language returns us to Carla's use of others rather experience as a source of knowledge.

> (November 7) I also get ideas from (name of friend)...I get ideas from people at (name of another public school).

Extracts from the fourth interview clearly establish that Carla has not learned to rely completely upon her developing experience.

> (November 26) I mean I'm just learning to cope in the classroom. I'm learning to establish a routine, to establish a trust....In the course we were given all these questions to ask about evaluating, but he didn't give us any concrete things about how we should write a report....(Interviewer: How did you make those rules up?) I had a book. And it was very simple and it talked about classroom management. It said to make your rules simple and here's three of them....when (my time) is free, I certainly don't want to pick up a book on "How to Teach--How Children Learn to Spell." Maybe I'm not being as professional as I could be. But I think in a couple of years, once I get feeling that way, maybe then I'll pick up some books on the theory of "Why."

There is little in Carla's four interviews that suggests how she thinks about her own teaching and the learning of her class. But, there are references to such things as mathematics centres, manipulative games for mathematics, reading groups, printing centres, doing creative writing, having the children select activities, and also having them touch furs to feel differences. The research team understands these activities to be occasions for learning by interaction with experience. The data do not show whether or not Carla has understood this. Is she has, then she appears not to have seen the incompatibility between how she thinks she should have learned about teaching and how her class learns. If she has not understood the impact of experience in the learning of her class, then it will be especially interesting to see how her view might change over time.

Anne

Anne was involved in Russell's study and is participating in our current work, so we have interviews with her taken during her first year of teaching--in a high-school agricultural course. The first set of extracts from these interviews concerns Anne's use of "structure" and its association with control. Anne talks of structure 18 times in the interviews of September 18 and October 15, 1985, for example:

> Things like neat notes and tests keep it fairly structured...Like they've been having such structured class, the grade twelves...I want that structured feeling because you feel you are more in control to have a really structured feeling...I feel like I've got to be in control of every movement that they make or else they're not getting what I want...I guess I'm afraid of not having structured classes... You have to let loose with your idea that everything's going to be structured all the time because it just can't be almost...I must be too worried about not having control at all times...I guess I feel that I have to have the control before I can let them loose.

There are very few references to structure in the later interviews of the first year, and even fewer in the second year. For instance, in the interview of September 30, 1986, she says, "I guess they really like that structure. That's one thing, this year I give a lot more structure"; and on October 30. "I like to see them have enough rules that they're not acting up, and enough to challenge and enough structure to the class."

The earlier uses of structure seem to refer to control more than do the latter, where we see a concern emerging for structure aimed at helping learning: "So I think they almost like to have that sort of structure of note writing where they're writing notes but not really writing." It is as if Anne is seeking a balance between maintaining an orderly class and enhancing learning. The language she uses in describing this presents control as a commodity that can be wielded. Structure is somewhat more complex because it appears as a commodity and it is also used as a qualifier. Certainly it appears to fulfill the idea of order and organization.

A second interesting item in Anne's vocabulary is "attitude." Early uses show that Anne is concerned about changing her own attitude: "In that class I think I'm starting to change my attitude some" (September 18, 1985), and "I think the main change has been just in attitudes towards kids, and changing my idea of what has to be done for work. Like changing this idea that everybody has to be quiet" (October 3, 1985). The remaining uses of "attitudes" are to those of the students: "I just don't think they've got the attitude for it...Unless he gets a better attitude about it" (September 81. 1985); "The first day I wasn't all too impressed with her attitude" (January 29, 1986); "Jason's problem was because of a poor attitude...it's hard to deal with their attitudes when they're like that" (September 30, 1986). The notion of an attitude being an object that is held and can be changed is evident in these examples. Although the term has not been mentioned in the interviews of the last three months, we will be attentive to how it is used and will begin to discuss with Anne how she views this concept.

Discussion

This brief account and few examples can hardly reveal the full scope and potential of the current research. However, the above material surely goes some distance in revealing the complexity of understanding the nature and development of professional knowledge and thought, if only by pointing to the array of questions that arise when one begins to take note of the linguistic character of the language teachers use when speaking of their work. As the study moves forward, we are increasingly aware of the extent to which we are involved in trying to document and analyze developments in professional knowledge that have been masked or obscured by the assumptions that dominate existing teacher education programs. These assumptions cover a broad range, from believing that propositional knowledge can be applied directly to practice, to believing that the value of practice teaching lies in unreflective practice--a practice that is unmediated by language. We expect "metaphor" to become a powerful concept in the process of identifying assumptions that we may be quite unaware of.

Also, we anticipate that the approach sketched here will assist our attempts to determine which questions about teachers' language are central to understanding the source of teachers' professional action.

Central to all of this are the two puzzles: how metaphors become part of professional speech, and the role that metaphors play. Although we are unable to resolve these puzzles, we are confident that they will have to be addressed in any account of the development of practical knowledge if it is to be coherent and satisfying.

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